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ASSESSING TECHNOLOGY STOCKS

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"WHAT WERE WE THINKING?"

Among both professional and novice investors, this was the typical reaction during the painful spring of this year when technology stocks in general—and internet stocks in particular—fell dramatically from their highs, wiping out hundreds of billions of dollars in paper wealth.

Just days before the correction ensued, *The Wall Street Journal* declared on March 10, "It's Out of Control" as it headlined the NASDAQ Composite Index breaking through the 5000 level. "Now that investors have concluded that the Fed and valuation don't matter to stocks at the forefront of the technological revolution, the sky seems to be the limit," the article concluded. That day, the NASDAQ advanced to a high of 5048, but shortly thereafter, market psychology abruptly changed. In the ensuing weeks, the index that had captured the imagination as well as the dollars of so many investors in recent years declined steadily to a low of 3167 on May 23, representing a startling collapse of almost 40%.

Although it remains well off its peak, the NASDAQ has recovered impressively from its spring swoon, hovering around the 4000 level. Nevertheless, the episode has given all investors good reason to seriously re-evaluate their holdings in the sector that was clearly the driving force behind the stock market's historic advance during the 1990s. As noted in our *1999 Investment Performance Review*, the single most dominant factor by far in distinguishing the best performing retirement boards from the laggards in recent years has been the extent of portfolios' exposure to technology growth stocks. Without drawing any conclusions or focusing on any individual stocks, this report is intended to broadly discuss some of the basic economic and fundamental issues pertinent to the analysis of this vital sector.

Technology stocks are not a new-found sector. Since the beginning of the twentieth century, the advent of automobiles, airplanes, and electronic appliances have all created a buzz in investment circles. The first technology mutual fund—The Television Fund—was created in 1948. The sector struggled through most of its history, and it wasn't until new information technology products permeated every facet of our lives in the 1990s that tech stocks became the most dynamic segment of the equity universe.

Technology is not a homogeneous sector but consists of several different industries. The sector broadly encompasses software and related services, technology hardware and equipment, and telecommunications services, with each of these major business categories having several subgroups.

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DISPROPORTIONATE INFLUENCE

Today, technology stocks have an influence in equity portfolios disproportionate to their contribution to Gross Domestic Product. Technology companies represent about 8% of GDP and account for 5% of national employment but comprise about 33% of the market value of the S&P 500, the equity index intended to represent the largest companies in the most important sectors of the economy. This percentage, up from 9% at the end of 1990 and 15% in 1995, is the highest for any sector in the history of the index. (Technology companies represent about 70% of the NASDAQ Market.) The disparity between economic and financial market impacts can be seen in the fact that technology, while only representing *one twelfth* of overall economic activity, currently accounts for *one third* of economic growth. Also, reflecting their above-average returns-on-equity (ROE), technology companies represented *one sixth* of the profits in S&P 500 companies in 1999 and this number is expected to exceed *one quarter* next year.

Technology stocks are not only the largest but also the most volatile sector of the stock market. Since the valuation of companies in this sector is highly dependent on expectations of future earnings, small changes in interest rates (as used in the discounting of future earnings to the present) or in the projected growth rates of these companies can have a major impact on prices. Tech stocks are generally considered to have twice the volatility of the rest of the market and are seen as contributing about three quarters of the monthly performance of the S&P 500. Indeed, S&P reported that the technology sector has accounted for more than 90% of the Index's capital appreciation through the first eight months of this year.

Technology's contribution to the S&P 500 in recent years has been astonishing. Without the tech sector, the S&P has been in a volatile, flat trend since April of 1998. Over that time, the tech component of the Index is up about 140% through August of this year.The performance of the S&P itself has paled in comparison to that of the tech-dominated NASDAQ; from the beginning of 1999 through the end of August 2000, the S&P 500 underperformed the NASDAQ by nearly 70%.

Tech stocks have dramatically outperformed the market not only because the underlying companies have been more profitable and enjoy much more rapid growth than those in other sectors, but also because investors have recently awarded them sharply higher valuations relative to their earnings. Among all S&P stocks, the ratio of market price to next year's earnings on a per-share basis was recently estimated at 24. For the technology component of the S&P, the number was 42. Technology's P/E ratio had been in the same range as that of the overall market as recently as 1998. For some of the fastest-growing, most dynamic tech companies, the P/Es have been in the triple digits. (Nine of the 78 technology companies in the S&P 500 have P/Es above 100.) Outside the S&P, many high-flying tech companies have no P/E at all since they have not yet achieved any profits. Adding to the potentially worrisome implications is that the S&P composite P/E of 24 is itself high by historical standards.

The spring tech sell-off was affected by Microsoft's legal problems as well as by fears that rising interest rates would slow the economy, but, more than anything, it was caused by investors' growing concern that valuations had risen unrealistically and dangerously high. Even if one looked at the valuation of tech stocks relative to their projected growth rate (the so-called PEG ratio), the sector still looked high by historical standards, particularly for large-cap stocks.

THE BUBBLE BURSTS

It is now apparent that for many tech stocks, particularly internet companies, the market was indeed a bubble and now it has burst, probably for the foreseeable future. Reflecting upon the bursting of the dot.com balloon, *The Wall Street Journal* noted, "Hot air can carry you only so far."

Before the spring debacle, it was apparent that many new tech companies had achieved market valuations that could not be justified by traditional analytical tools. As one Wall Street strategist declared, "What you have is not necessarily investment by analysis but investment by state of mind." Stocks were trading not on the basis of what they were rationally worth but on the basis of what the next investor would be willing to pay. Wall Street analysts were explicitly recommending securities not on the basis of what *they* thought but on how they expected the *market* to value stocks. Unable to justify current valuations by conventional analysis, analysts rationalized their recommendations by looking at valuations in the context of those of other, similar stocks.

The information revolution has been certainly causing an historic economic transformation and the psychological effects on the market have been understandable, but more than ever before, stock prices were rising based on pure momentum. Consideration of profits, cash flow, and other traditional measures were shunted aside as investors concluded that there was no risk in buying a stock at whatever price relative to its fundamentals as long as there appeared to be an excellent chance that the stock could be re-sold to the next investor at an even higher price. For longer than anyone expected, to the consternation of skeptical traditional investors, such investing proved remarkably profitable, but by April, it became painfully obvious that momentum investing can work on the downside as well as the upside.

Up until the spring, venture capitalists, investment bankers, and investors together took many companies public well before they had proven their business plan. Only about 30% of the companies going public in 1999-2000 had established profitability, down from 60% as late as the mid-1990s. As money streamed into tech-oriented growth mutual funds, the portfolio managers had no choice but to chase performance by continuing to buy the market's hottest names. Along with the success of financial news television networks, explosion of on-line trading made speculation even easier for novice investors throwing money at stocks they knew very little about except that their prices were going up. When investors could make more in one day from a successful Initial Public Offering than traditional investors would expect over five years, it was clear that the conventional rules of investing had been turned on their head.

It is no exaggeration to say that the Internet is changing our lives (can you imagine life without e-mail?), but it is apparent that many of the startups funded by venture capitalists, taken public by major Wall Street firms, and purchased by greedy investors had little chance of success. Many of the goals of these companies were unreasonable, but even for those with creative or promising ideas, executing them proved much harder than conceiving them.

In early March of this year, 20% of the value of the NASDAQ index was represented by companies that had gone public since 1999, three quarters of which had no earnings. Also, the total market capitalization of internet stocks at the end of February was $1.2 trillion, but the companies involved had net earnings of *negative* $2.5 billion.

In February, highly-respected Morgan Stanley market strategist Byron Wien had

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warned that the market seemed to be attaching no risk to new economy stocks and no opportunity to old economy stocks. Among other things, he questioned why the market was ignoring the potential benefits that could accrue to traditional manufacturing companies from incorporating technology into their operations.

Although no one can predict when, all excessively exuberant markets inevitably fall victim to the laws of gravity and the tech shakeout that commenced in March inflicted a great deal of financial and psychological pain. Many of the large cap established tech companies have substantially recovered but not so for the vast majority of internet retailers and similar startups for which the shakeout—and the struggle for survival—is continuing. It may come to pass that the recent correction simply marked the end of the beginning of the current technological revolution, but now that the magic has worn off, things will not be the same. Hopefully, a more logical, rational, and healthy market will ensue.

FUTURE PROSPECTS

What does the future hold for technology stocks? There is no question that the sector as a whole is growing much faster and is producing returns on equity far greater than old economy stocks. NASDAQ companies had impressive earnings growth of 44% over the past four quarters, and profits are expected to grow by 30% over the next five years. The information revolution is having an undeniable effect on our economic life—in how we communicate, in how consumers and businesses do business, in how we learn, and in so many other ways. Companies and organizations in every economic sector realize that they must keep spending on technology in order to stay competitive. As the high tech revolution spreads across the globe, US exports of semiconductor and telecom equipment are very robust. It may also be a hopeful sign for domestic growth that, in some areas such as wireless communications, the US is clearly behind other parts of the world.

Technology appears to be giving us the best of all possible worlds—booming growth with little inflation. It is helping to boost industrial productivity in many ways, beginning with reducing the need to build manufacturing plants and related infrastructure. By allowing lower inventory levels, technology has generally helped to reduce demand for industrial commodities. As seen in fiber optics replacing copper wire, new abundant materials are replacing older scarcer ones. Tech companies themselves generally don't need large office complexes used in conventional manufacturing. In a number of ways, technology is serving to keep a lid on wage pressures. Perhaps symbolic of technology's effect on productivity is the fact that the sector itself, in its most basic form, uses one basic commodity—knowledge.

How can the future not be bright for technology when the Internet is generally seen as still being in the early stages of its development and use? As some see it, the 1990s saw the personal computer getting up to speed and the Internet evolving as a revolutionary tool for e-commerce and so many other uses. In their view, the new decade will see PCs and the Internet combining with broadband, wireless, video streaming, and other emerging technologies for further advances and gains in productivity beyond what we currently imagine.

On the other hand, there are those who are skeptical, noting that the bloom is already off the rose in areas like online shopping. Weakness in the IPO market since the spring sell-off has made it much more difficult for young firms to raise money to finance their visions. Furthermore, technology is the most competitive of all indus-

tries, and prices of many of its products are trending down. As some observers note, there will certainly be some companies with the vision, management, and execution to enable them to survive and prosper by not only maintaining their growth but their profitability as well. These companies will justify and deserve their market valuations. But which ones will they be?

Valuation—that is, indeed, where much of the future uncertainty lies. The question is not whether the tech sector as a whole will continue to be a driving force in our economy but whether the stock prices of many of the companies—even after the spring correction—anticipate outcomes that may be difficult to achieve and which leave little room for disappointment.

As noted author and market historian Prof. Jeremy Siegel of the Wharton School has stated, "There has never been a company with a big market value that can justify a P/E multiple over 100." He cites Polaroid as an example of a stock that achieved a P/E multiple of 95 in the 1970s but has floundered since. Looking back at the Nifty Fifty era of the late 1960s, Prof. Siegel found that "no stock that sold above a 50 P/E ratio was able to match the S&P 500 over the next quarter century." Like many other traditionalists, he notes that today's high valuations assume that companies like Cisco, having already shown meteoric growth during the past decade, will continue to achieve earnings growth of 30% or more annually for five or more years into the future. As money manager Sanford Bernstein notes, only one company (IBM in the 1960-70 period) has grown by more than 15% a year for 15 years. As one cautionary example, Microsoft's stock has fallen significantly this year not only due to its legal problems but also due to the fact that its growth rate has fallen from 30% to the 20% range.

Widely-read columnist Alan Abelson, an unabashed cynic, recently wrote in *Barron's*: "We've long felt that because of the accelerating rate of technological invention and innovation, and the rapidity with which the latest new thing is shoved aside by an even newer new thing, most techs deserve lower rather than higher multiples than the average staid but more stable company."

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HISTORICAL PERSPECTIVE

History offers little comfort to investors seeking sustainable profits from today's tech sector. The great technological innovations of the past did not necessarily prove very profitable for investors. The invention of the automobile spurred the birth of several hundred US car manufacturers; only three survive (one is foreign-owned) and none have been strong market performers throughout the years. Only a few companies (such as RCA, acquired by General Electric in 1986) survive from the electronics revolution of the early twentieth century.

Legendary investor Warren Buffet notes that rather than invest in any of last century's new automobile companies, none of which proved to be stellar investments, it would have been better to "short horses". (That is, sell a theoretical security representing horses in the expectation that that security could be repurchased at a lower price in the future.) He further observes that the airlines have been such historically bad investments that, had he been around and known what he knows now, he would have shot down Orville Wright and his early airplane from the sky in 1903.

On a more serious note, Buffett declares that "the key to investing is not assessing how much an industry is going to affect society, or how much it will grow, but rather determining the competitive advantage of any given company and, above all, the

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durability of that advantage." He found that challenge to be sufficiently difficult that he severely limited his investments in nearly all tech stocks in recent years, to the clear detriment of his company's performance.

In a commentary with chillingly direct implications to the momentum investing that recently dominated the market, Benjamin Graham (author of the seminal book *Security Analysis*) wrote back in the 1930s that in the final analysis, the determination of stock values is not a voting mechanism but a weighing mechanism. That is an interesting way to express the inevitable truth that, sooner or later, value—measuring a company's true worth—does count. At some point, earnings—not just yearnings—are necessary to justify a company's valuation.

Adding to the challenge of evaluating tech stocks today is the symbiotic relationship among many of them. There has been some recent weakness in the stocks of telecom carriers (such as Lucent Technologies) that aim to lay massive transmission networks to handle growth in data transmission over the internet. If this sector indeed faces weaker demand for its product, the equipment manufacturers (like Cisco) that supply them would certainly be affected. Yahoo has achieved great success as an internet portal, but a significant portion of the company's advertising revenues derives from fledgling internet companies that are struggling for survival.

At least up until the spring correction, it was apparent that investors in tech stocks saw the sector as somewhat detached from overall economic trends. Their success has been seen as deriving not from general economic growth but for demand for specific products and services. Some believe that an economic slowdown would actually increase tech spending by companies seeking to lower costs through greater efficiency. One of the rationales for tech stocks' counterintuitive relative strength in the face of rising interest rates was that most companies in this sector don't issue debt. It will be very interesting to see whether or not these theories hold up if and when a real economic slowdown occurs.

Whatever one thinks about technology stocks, they cannot be avoided in today's market. They constitute about 33% of the S&P 500, a similar percentage of the broad market Wilshire 5000, as well as sizeable representations in most other major market indices. According to Morningstar, technology stocks not only represented 44-48% of the assets of all growth mutual funds as of June 30, 2000, but also 12% of the assets of all value funds. Investors who thought they were avoiding risk by minimizing exposure to this sector in recent years were actually assuming a significant risk by underweighting the stock market's dominant sector.

Depending on one's stock selection and whether an investor was an early or late entrant into the sector, technology stocks have rewarded investors with either unimagined pleasure or intense pain in recent years. Going forward, history and logic tell us that only a small number of today's tech companies are likely to survive to become profitable long-term investments for their shareholders. Separating the winners from the losers will be among the greatest challenges facing investment professionals in the months and years ahead. ◆

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